EVALUATION OF SEA LION PREDATION IN THE BONNEVILLE DAM TAILRACE

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ABSTRACT

Since 2002, we have used surface observations to meet three objectives: (1) estimate the number of adult salmonids (*Oncorhynchus* spp.) and other fish consumed by pinnipeds in the Bonneville Dam tailrace and estimate the proportion of the January-May adult salmonid run impacted; (2) determine the seasonal timing and abundance of pinnipeds at Bonneville Dam, documenting individual California sea lion (*Zalophus californianus*) presence and predation activity when possible; and (3) evaluate the effectiveness of pinniped deterrents used at Bonneville Dam.

In 2008, we observed diurnal pinniped predation on adult salmonids and other fish in the Bonneville Dam tailrace from January 11 to May 31. An estimated 2.9% (4,466) of the January 1 through May 31 Bonneville Dam salmonid run was taken by sea lions at the dam. When adjusted for unidentified catch, the estimate was 3.2% of the run (4,927). Chinook salmon (*O. tshawytscha*) was the most commonly identified prey species, comprising about 93% of observed salmonid catches. Pacific lamprey (*Lampetra tridentata*) comprised only 2.0% (145) of observed catch, the lowest proportion we have recorded in seven years of monitoring. Steller sea lions (*Eumetopias jubatus*) continued to be the dominant white sturgeon (*Acipenser transmontanus*) predator in the area, taking 97.7% of the 606 observed sturgeon catches in 2008.

At least 84 California sea lions, 17 Steller sea lions, and 2 harbor seals (*Phoca vitulina*) were documented during the study period. The highest number of pinnipeds counted on any one day was 63 (April 16) and the longest recorded residence time for an individual California sea lion was 80 days, continuing upward trends in peak abundance and residence time at Bonneville Dam. Steller sea lions were not only more abundant than in previous years, they also did not leave after dam and boat-based hazing efforts began, as they had in 2006 and 2007.

Physical barriers, including sea lion exclusion devices (SLEDs) and floating orifice gate (FOG) barriers, apparently prevented sea lions from entering the fishways, but acoustic deterrents installed near fishway entrances continued to have no visible effect on the sea lions. During daylight hours, dam-based and boat-based crews from partnering agencies used non-lethal pyrotechnics and rubber bullets to haze sea lions in the dam tailrace. Hazing did appear to temporarily alter the behavior of some sea lions, but hazing efforts did not reverse the upward trend in predation estimates.

The Oregon and Washington fish and wildlife departments used four floating sea lion traps to capture, then either mark and release or permanently remove sea lions. Of the 11 California sea lions captured, seven were removed as authorized by NOAA under Section 120 of the Marine Mammal Protection Act, and four were processed (measured, weighed, marked with a 3-digit brand) and released. Four California sea lions and two Steller sea lions died on traps under unknown circumstances on May 4, halting trapping operations for the season.